TECHNOLOGY DEPT.

The AMERICAN HOROLOGIST

INCORPORATING

HOROLOGY

THE NATIONAL MAGAZINE
FOR ADVANCEMENT IN TIMEKEEPING

EXTRA
SPECIAL

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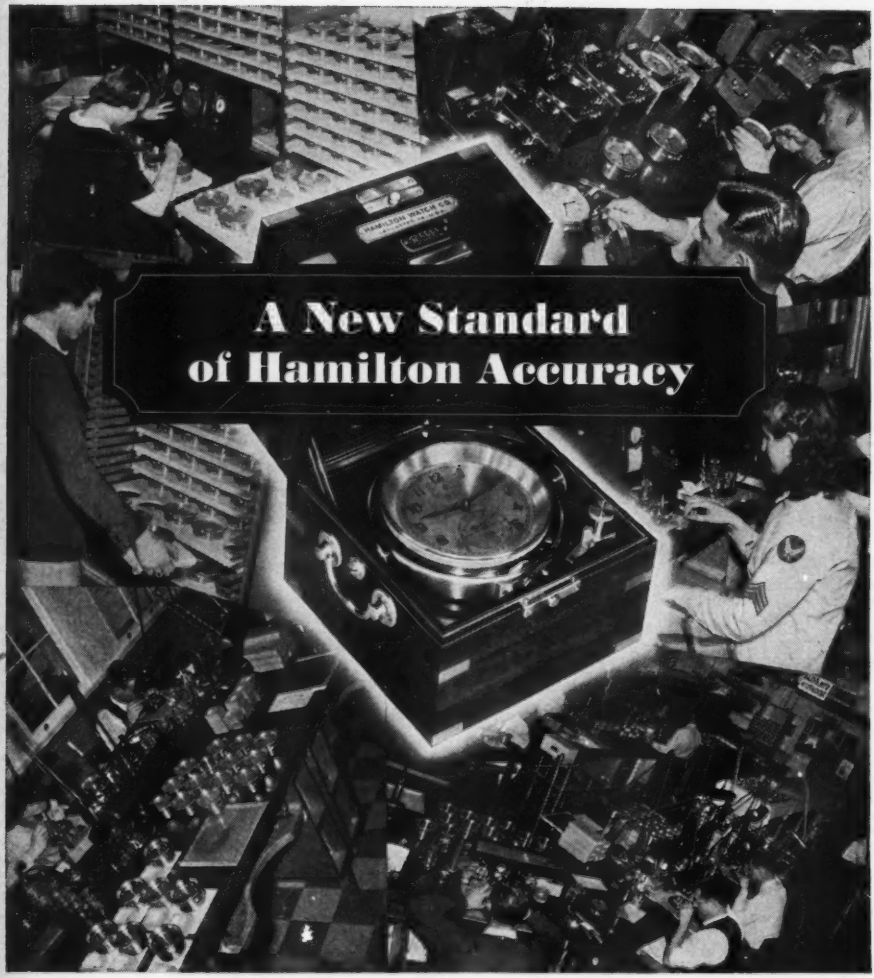
Vol. 10 JUNE, 1943 No. 6
TENTH YEAR OF PUBLICATION



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TENTH YEAR OF PUBLICATION

The AMERICAN HOROLOGIST

Incorporating HOROLOGY

Published Monthly

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ODD But TRUE

By Weil

JACOB BACHTOLD, FOR 38 YEARS CUSTODIAN OF THE NEW YORK CENTRAL'S 1000 CLOCKS, CAN DETERMINE BEFOREHAND HOW FAR OFF THE MASTER CLOCK WILL BE AND SET IT ACCORDINGLY.

DURING THE COLONIAL DAYS MANY WOMEN WORE TINY WATCHES SET IN RINGS. THESE WATHES WERE WOUND BY TURNING A CIRCLE SURROUNDING THE DIAL.

PRIVATE RALPH BARTON, WASHINGTON, UPON INSPECTING HIS WRIST WATCH AFTER IT STOPPED, FOUND A FULL GROWN MOSQUITO CLOGGING UP THE WORKS.

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What makes a watch PROUD of the crystal it wears?

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Determing The Age of Antique Watches

In determining the age of a watch, many points must be considered. If the watch be of English manufacture and has a case, first note the hall mark and table and you can readily establish the age of the case. This is, however, not an infallible rule for fixing the age of the movement, for many movements are placed in cases made years before or years after the movement was made. In conjunction with the date letter of the case, you will have to take into account the style of the movement and this you can best do by carefully examining the various parts of the movement and comparing them with the following chronological list of inventions:

1500. Watches were invented about this date; the first ones being round, not oval in shape. The first watches were made entirely of iron; the pinions, wheels, cocks and pillars, as well as the plates, being made of this material.

1525. The fuzee was not employed in watches until about this date, although it was used in clocks as early as 1509.

1530. Brass plates were introduced in Nurnberg about this date.

1550. Oval or egg-shaped watches came into vogue about this date.

1570. Hexagonal and octagonal shaped watches came into vogue about this date.

1575. The mechanism for taking up the mainspring was first applied.

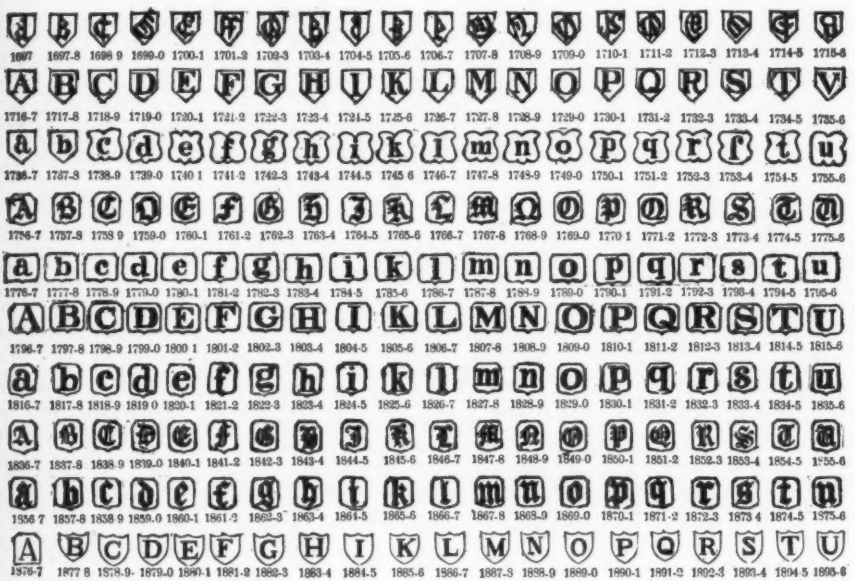

Table Of English Hall Marks.

1587. Watchmaking was introduced as an industry into Geneva, Switzerland, by Ch. Cusin, although a few watches were made in Switzerland prior to this date.

1590. The fuzee chain was invented in this year by Gruet, of Geneva, gut being used prior to this time, but the chain did not come into general use until about 1600.

1575 to 1600. Cases of rock crystal became popular about this time.

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1615. Watch glasses were introduced about this date, as a protection for dials, although rock crystal was used as early as 1550.

1620. Cases covered with tortoise shell made their appearance about this date and continued in style more or less up to 1800.

1632. Enamel paintings in colors was introduced in this year and therefore watches with colored enamel ornamentation on the cases were made subsequent to this date.

1635. Enamel dials were invented in this year by Paul Viet, of Blois, France.

1640. Pair cases came into use about this time, as it was found that enameled watches needed the protection afforded by the outer case.

1650. Watch cases with figures in repousse, both gold and silver, first made their appearance about this time. Three cases were first used at about this period. The inner case of plain metal, the second in repousse and the third of shagreen, tortoise shell or shark skin ornamented in pique. In some cases the repousse was covered with a glass to preserve it.

1658. The balance spring was invented in this year, but was not generally used until nearly the close of the 17th century.

1670. Very high and globular shaped watches came into vogue about this time.

1676. Repeating watches were invented in this year.

1687. The minute hand was not employed until about this time, the hour hand only being employed prior to this date in watches, although the minute hand was used as early as 1610 in clocks.

1700. Watch jewels came into use about this year. First keyless watches were made in this year. Watches with enameled placques in lieu of pierced balance cocks date from this year.

1710. Cases with chased figures became popular about this period. The cylinder, or horizontal escapement was invented in this year by Graham, but was not generally used until about 1800.

1711. Dust bands were first used on watches.

1720. Pendule watches first came into use.

1722. The rack lever escapement was invented in this year.

1740. Watches with cases a quatre couleurs (four colors), made their appearance in this year.

1749. The compensation balance was introduced in this year by Harrison.

1750. The duplex escapement came into use in this year.

1760. The chronometer escapement made its appearance in this year.

1765. The lever escapement was invented in this year by Mudge.

1774. Dust caps were first applied to watches about this year.

1776. Lepine introduced thin watches in this year.

1780. The helical balance spring was introduced by John Arnold in this year. Gong wires first made their appearance about this time. Previous to this period bells were used. The seconds hand also came into use about this year.

1790. Watches with movable figures, musical works and those having figures striking upon bells originated between this date and 1820.

1800. Watch cases decorated with pearls came into vogue at about this date.

1810. Spherical balance springs were invented by Frederick Houriet, of Locle, in this year.

The pillars, dial, hands, pendant and balance cock often aid materially in determining the age of a watch, although any one of them, when considered alone, cannot be relied upon to establish anything definite. When we find a watch with an enameled dial we know that it certainly was not made prior to 1635, and we must therefore proceed from that date towards the present era. We find

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R. P. (DICK) GALLIEN

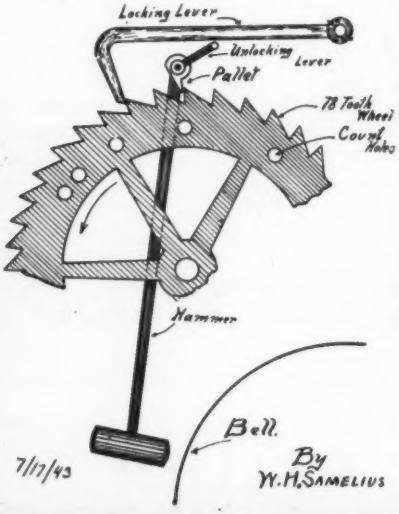
Watch Materials, Tools and Supplies

it has a pair of cases, and therefore could not have been made prior to 1640. It has a balance spring which is evidently original, and so is not older than 1658. It has a minute hand, and on examination we find the mechanism original, and so bring the date down to 1687. The jewels in it indicate it was made since 1700, and as it has a duplex escapement it must have been made since 1750. As dust caps were not applied prior to 1774, and as our specimen is supplied with this device, we must naturally conclude that it was certainly made since 1775. Here all absolute signs fail, and we can only approximate its age, unless we have a list of old watchmakers with the dates of their business careers.

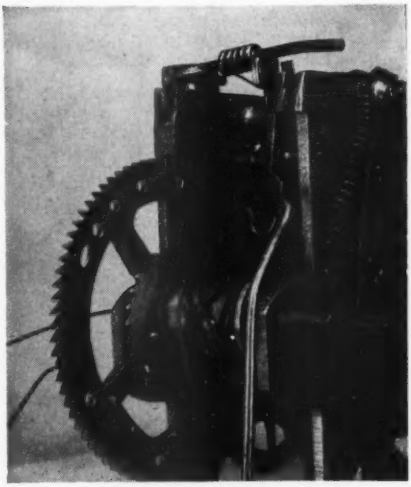
One Wheel Striking Mechanism

By W. H. SAMELIUS

Among the many historical timepieces employing striking mechanisms, it appears our earliest authentic records tell us that Henry DeVick who built a clock for King Charles V of France in the 13th Century, was the first clock to strike the hours. Some writers assume that there must have been earlier mechanisms built from which DeVick got his ideas or possibly made improvements on.



Thruout the years, many various mechanisms have been devised for striking the hour and half hour. Recently I was called on to repair and rebuild a clock that strikes the hour, but employs one wheel only for the



train. It is of such unusual construction, a description of it and photographs are in order.

The drawing shows the large and only wheel employed which acts as

an escape wheel and count wheel. When in action, the hammer, which is attached to the pallet arbor, is raised from the bell, the tooth of wheel giving impulse to the pallet. As the hammer returns to strike the

the pallet arbor lifts the locking lever releasing the tooth, allowing the wheel to advance forward, and in turn deliver another impulse to the pallet. The hammer itself acts very much the same as a pendulum and the speed of the hammer is regulated by the weight, or pulling power. The arbor carrying the count wheel also carries the drum upon which the cable is wound, the same as in our modern clocks.

The photographs show the unlocking system. Attached to the pallet arbor is a lever projecting upward. This lever in turn raises the count wire in and out of the holes in the pallet wheel. When the count wire reaches a hole, it drops down so the stop lever drops in front of the lifting lever attached to the pallet arbor, stopping the entire mechanism until released for the next hour's strike.

Wheels and Pinions—Diameters

By IMRO PETERMAN

The watchmaker is often called upon to supply a new wheel for a watch or clock. Many have not been fortunate enough to get practical and theoretical training that will enable them to quickly make the necessary calculations leading to the making or obtaining of the correct wheel.

There are any number of books readily obtainable from your local library, or purchasable from firms who make a specialty of publishing books on applied mechanics. There are a number of books solely pertaining to gearing and calculations. Of course, these books apply in the main to gearing as used in large machines or mechanical devices but the principles are the same and can be applied to watches and clocks with some modifications.

Terms used in gearing are sometimes puzzling to the layman and require a more or less clear explanation, for example, addenda, dedenda, pitch circle, pitch diameter, diametral pitch, active diameter, effective diameter, and so on.

To make these terms more explicit we will first give definitions, the sketches will serve to clear up these definitions.

The pitch circle is the effective diameter, it is the line of contact of any two gears that mesh or operate from this contact, the addenda is that portion of the tooth above the pitch circle and to the end of the tooth, the dedenda is that portion of the tooth below the pitch circle and to the base of the tooth, circular pitch is the distance from one tooth to the next measured on tooth centers and radial to the center of the gear, the active diameter is the overall diameter of the gear wheel. Both the effective diameter and active diameter are important elements to keep in mind and at the same time keep separate. There is a definite relation between the active diameter, the effective diameter, and the length of the outer portion, or adenda, of the tooth. A complete treatise on gearing would require much more space than is allowable in an article of this type in this magazine, so we will confine our efforts to a simplification of the rather lengthy rules involved.

Actual and Effective Diameters

The effective diameter is equal to the actual diameter less twice the point of the tooth. Since we must know the length of the point of the tooth we have, for wheels, the length of the point of the tooth is equal to half of the tooth; in the case of pinions it is less, and varies with the shape of the tooth. Keep this difference in mind.

As the length of the tooth of a wheel is equal to the pitch, and the pitch is easier to calculate, this relationship is more conveniently stated as follows:—the effective diameter is equal to the actual diameter less the pitch of the wheel.

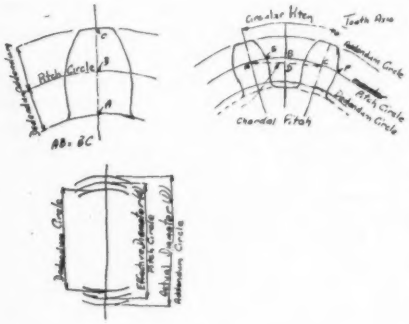
The pitch plays an important part in these calculations. If "d" is the effective diameter, "z" the number of teeth and "t" the pitch, then,

$$t = \frac{D\ 3.1416}{z}$$

and if "D" is the actual diameter then

$$t = \frac{D\ 3.1416}{z \text{ plus } 3.1416}$$

Calculations for pinion dimensions are rather more complicated than the corresponding ones for wheels. The principle is the same, but the relationship between the quantities differs. As before, the difference between the actual and effective diameters is twice the length of the point



of the tooth. The difficulties arise from the fact that differently shaped teeth can be used for pinions and the calculations depend on this shape. Twice the length of the point is not equal to the pitch. It is necessary to distinguish between rounded and pointed teeth, and also between pinions having less than ten teeth and those having more than ten teeth.

The actual diameter, in the case of round cut pinions with less than ten teeth is 1/3 "t" greater than the effective or pitch circle diameter. For round cut teeth with ten or more teeth the difference is 2/5 "t"; for pointed pinions with less than ten teeth it is ½ "t"; and for pointed pinions with ten or more teeth 3/5 "t". These four cases will be sufficient for most purposes.

Application of Principles

Assume the loss of the third wheel and pinion from a pocket watch. The dimensions and the number of teeth of both parts are unknown. The calculation of the number of teeth has not, so far, been considered; but this example will illustrate this procedure. The dimensions and the number of teeth of the center wheel and the seconds pinion are known. The missing number cannot be determined from these quantities alone. The gear ratio or depth must also be known. The depth can be determined by measurement, but the gear ratio must be calculated. The calculations will be made with the help of the gear ratio. The gear ratio must first be determined. The center wheel makes one rotation in an hour; the seconds wheel makes in the same time 60 revolutions. The gear ratio from the center wheel to the seconds wheel is 60. This total transition is to be performed in two stages. We must find two numbers, equal or nearly equal, which when multiplied together equal 60. Two such numbers are 8 and 7½.

Calculations

Having the following data:—

Actual diameter of center wheel is 22.5 mm (D).

Number of teeth on center wheel is 64 (z).

Gear ratio from center wheel to third wheel pinion (i) is 8.

Required: Size and number of teeth on third wheel.

First determine pitch of center wheel.

$$t = \frac{D\ 3.1416}{z \text{ plus } 3.1416} = \frac{22.5 \times 3.1416}{64 \text{ plus } 3.1416} = 1.05 \text{ m}$$

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The third wheel pinion must have the same pitch. The effective diameter of the center wheel is

$$d = D - t = 22.5 - 1.05 = 21.45 \text{ mm}$$

The effective diameter of the third wheel pinion may be determined by two different methods. By dividing the effective diameter of the center wheel by the gear ratio we obtain

$$d' = \frac{d}{i} = \frac{21.45}{8} = 2.68 \text{ mm}$$

or, by multiplying the pitch by the number of teeth on the pinion and dividing by 3.1416 we obtain

$$d' = \frac{tz'}{3.1416} = \frac{1.05 \times 8}{3.1416} = 2.675 \text{ mm}$$

The small discrepancy is due to approximations made in the calculations.

The actual diameter is now determined from the effective diameter and the pitch, viz:—

$D' = d'$ plus $0.5t = 2.68$ plus $0.5 \times 1.05 = 3.205$mm

The number of teeth on the pinion is—

$$z' = \frac{z}{i} = \frac{64}{8} = 8 \text{ teeth}$$

The dimensions of the third wheel must now be determined.

We are given the actual diameter of the seconds pinion "D3'" equals 2.8 mm. The number of teeth on the seconds pinion is 8 and the gear ratio is $7\frac{1}{2}$. We will first determine the number of teeth. This will be equal to the number of teeth on the pinion multiplied by the gear ratio. That is

$$z = z'i = 8 \times 7\tfrac{1}{2} = 60 \text{ teeth}$$

The pitch

$$t = \frac{D'3 \times 3.1416}{z' \text{ plus } 0.5 \times 3.1416} = \frac{2.8 \times 3.1416}{8 \text{ plus } 0.5 \times 3.1416} = 0.918 \text{ mm}$$

The effective diameter of the pinion

$$d' = \frac{tz}{3.1416} = \frac{0.918 \times 8}{3.1416} = 2.34 \text{ mm.}$$

The effective diameter of the third wheel we find from the formula:—

$$d = \frac{tz}{3.1416} = \frac{0.918 \times 60}{3.1416} = 17.54 \text{ mm}$$

The actual diameter of the third wheel is

$D = d$ plus $t = 17.55$ plus $0.918 = 18.47$ mm

We have thus determined all unknown quantities.

I am indebted to several sources for information on this interesting subject, particularly to Machinery Handbook, McGraw-Hill Books on Gearing, and for confirmation of some of the formulae I give credit to several of our English friends.

Repairing the Alarm Clock Balance Screws

By JOHN I. PARTRIDGE

Now that there is a definite shortage of the conventional type of alarm clocks owners are becoming repair conscious. Doubtless some of the repairs necessary to keep these toilers in operation are what may appear to be costly to the owner. I have heard many of them complain that the original cost was less than the repair charges, this comes from the fact that drug stores and many other merchandisers have been offering a cheaply constructed clock for as little as 79c merely as loss leaders.

This attitude of the merchandiser refrects upon the good will and integrity of the jeweler, and associated enterprises, who should rightfully have control of the merchandising of every type of timekeeper. The drug tore and hardware merchant who has been selling alarm clocks is not at all interested in the running or performance of the alarm clock he has been selling, his interest is in getting the prospect into the store for other more profitable merchandise. Hence, it all comes back to the repairman in the form of complaints and criticisms as well as the usual headache.

Granted that considerable wear and tear to bearings is one of the evils these clocks fall heir to, and such repair means complete dismanteling of the clock. Certainly such repair is costly. It cannot be trusted to the inexperienced apprentice, or the beginner, who has more or less graduated to higher forms of repairing. Then it falls to the lot of more advanced workers to do this work, whose time is worth something more than an apprentices wages.

The most common fault of these clocks is the wear on the balance pivots and balance screws. Sometimes the balance screw seats go first. The only recourse in this case is either to replace—if you have replacements—or to regrind the cone a little deeper in order to remove worn sidewalls. Next in order, is to regrind the pivots ,easier said than done), and the arbor must be chucked in the lathe and spun true in running, then the grinding process begins. I use an ordinary small square or triangular shaped oil stone and grind at high speed, slightly curving the arbor point, that is to say, I do not try to hold to a perfect cone shaped pivot. After all, the bearing surface and working part of the pivot is concentrated on the very point which seats in the base of the cone of the bearing screw.

The one thing that has concerned me no little has been the method of keeping oil in these cone shaped screws where it will do the most good, in most cases the oil will not stay there but will quickly spread all over the inside of the cone and soon work out of the base which is left high and dry. Can anyone suggest a really dependable method of keeping the oil in the cone seat where it should be?

Case Hardening New Screws

This new shipment of screws for Swiss watches—will they stand up under the usual treatment—will they be sufficiently hardened to permit tightening—will the head and slot remain intact?

These are only a few of the questions that come to mind when we receive a new shipment of assorted screws. Usually they will not stand up, more often they will simply twist off before they are half-way seated, the heads twist off and leave a stub to be gotten out the best way one can, and then the slots become rounded off from use of small screw drivers.

But why worry about those things when they can be remedied very simply and quickly.

Obtain a small metal box of the friction lid type, place therein a few of the screws, add ground leather or bone, replace the lid, and then place the box in a good red fire and leave there for a short time. Then remove the box from the fire and quickly plunge into cold water. The screw

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will be found to be nicely case-hardened. The longer the tube is in the fire the thicker will be the case.

This treatment was suggested to me by my former instructor many years ago and has proven of value times without number since then.

The Watchmakers Bench

By O. I. CHRISTENSON

During my travels over the country I have had the opportunity to notice the benches of my many watchmaker friends. Section of district has nothing to do with it, the watchmaker is solely to blame for the criticism of being a sloppy housekeeper.

One of my very good friends in Ohio, a trade watchmaker, had the sloppiest and junk littered benches I have ever seen, yet he was able to produce very excellent results in his work, but, how he did have to hunt and search for every tool he needed. Another good friend in Maryland undoubtedly had one of the worst looking benches I have ever seen, there were at least 15 torn down movements covered with tin lids, broken goblets, and anything else that would cover the movements, even pieces of paper.

Down in Texas there was one very capable man who never completed the assembling of a watch the day he tore it down; his method was to tear down some 10 or 12 movements and then put them thru the cleaner, replace the dismantled movement in metal boxes and then, next day start assembling the collection. I have no way of knowing how many parts he had to replace from having things mixed up or lost but I have an idea it cost his employer plenty.

Now would it not be the simple way, if we must tear down a lot of watches, to place them in the standard covered movement boxes and then place the whole in a drawer that is kept solely for that purpose, and eliminate all this worry of replacing lost parts, and, maybe, having to clean the movement all over again?

The same applies to tools. It is not necessary to have a bench littered with a mass of tools, the upper central drawer of the bench can be utilized for the purpose of housing essential and commonly used tools, other tools such as screwdrivers, hand lifters, case opener, probe and so on can be kept on the top of the bench during the normal working day, then at night be placed in the drawer with the rest of the small tools and in the morning we know exactly where to locate each and every essential tool. The bench then presents a neat appearance if visitors happen in after the watchmaker has gone home for the night.

I know of one shop where it is the rule that the bench must be cleared before the workman leaves for the night, and it really does look very nice to see some 15 benches all lined up in order, and cleared of all unnecessary tools and equipment. This shop has very large front windows and is open to public inspection at all times.

How To Replace Anchor-Pallets

From Swiss Journal Horologorie

Many watchmakers are afraid of executing this work, especially if it concerns one of those small wrist watches which are our daily bread. First of all, the necessary tools should be laid out; there are three essential elements:

1. Brass or Germansilver tweezers, with two well sharpened points, but not too fine.
2. A round brass plate, about 40 mm. in diameter, bored with holes of different sizes, which will contain the stem of the anchor. Thickness of the plate, about 3 mm.
3. Two well-cut pins.

Work is started by removing all traces of shellac which might still adhere to the anchor. In order to do this, a pin dipped in alcohol is used, then cleaned with benzine. The same thing is done to the damaged impulse plane which is to be replaced, and

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the latter is measured with the help of the micrometer in order to be sure that the new one will fit absolutely perfectly. The assortment of

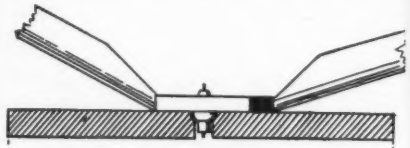

Fig. 2

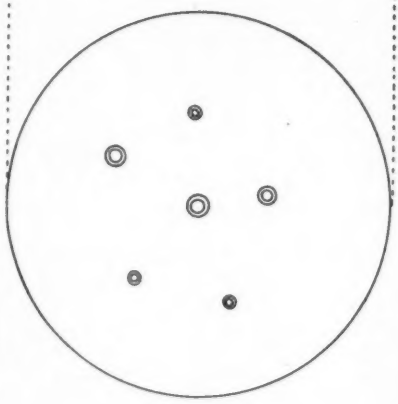

Fig. 1

Seitz jewels assorted by hundredths renders precious service in such a case. After having found the appropriate jewel, choose the hole whose diameter and drilling corresponds exactly to the inferior part of the anchor-stem. The latter should fit therein without forcing, but should not be able to move either. The anchor must be absolutely flat—this is indispensable. In order to handle the anchor, the tweezers mentioned above should be used; all the more should they be used in order to handle the impulse plane, whose angles can be so easily damaged.

In the watch industry many watchmakers proceed as follows: They place the impulse plane in an oblique position in the groove or hole and push it in place with the pin. This method does not appear to me to be very judicious; it is easy to damage

the impulse plane. I would prefer the following way:

After having placed the anchor on the brass plate, as indicated in fig. 2, the impulse plane is set, by means of the tweezers, in such a way that its posterior part sets exactly in the groove. During this time, the anchor

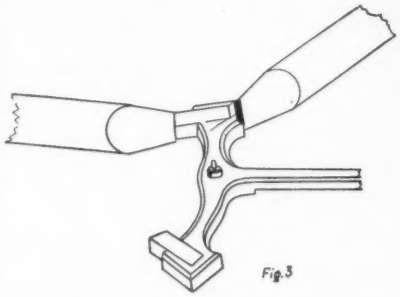

Fig. 3

is held in the desired position (fig. 3) by means of a pin; with another pin, the anchor is then pushed in the groove, which is done without difficulty, shifting being impossible. There remains the impulse-plane to be attached, which is done by heating the plate on which the anchor rests.

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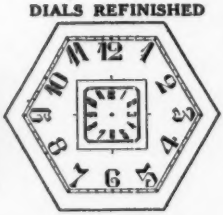

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Carbaloy or Wimet—The Hardest Metal

By IMRO PETERMAN

Since publication of my article on carboloy tipped cutting tools, in a recent issue, I have had numerous inquiries as to the nature of this very important metal.

In Europe it is known as Wimet, in this country it is carboloy. We will refer to it as Wimet.

Wimet is tungsten carbide cemented with cobalt. The materials in powdered form are pressed into the required shape, sintered in a neutral atmosphere at about 1500 degrees Centigrade (about 2732 degrees Fahrenheit) and the resulting alloy is cooled carefully to avoid warping. The main function of the cobalt is to bond the particles of tungsten carbide together, but it also affects the hardness and strength of the alloy.

The composition of Wimet is:—Tungsten 87.4 per cent; Cobalt 6.1 per cent; carbon 5.68 per cent. Specific gravity 14.5 to 14.8, hardness on Mohs scale is 9.7, heat conductivity 1.6 times that of cast iron. Wimet tipped cutting tools can be used at speeds of 350 to 1000 r.p.m. and feeds of 0.1 to 1.0 mm per revolution. Petroleum and soap solutions in water and alcohol are suitable lubricants.

Field Repairmen Training At Elgin College

Streamlined eight and sixteen-week courses to train Army personnel for watch repairs in the field have been launched a the Elgin Watchmakers College, where some 75 servicemen at a time will be grounded in watchmaking fundamentals during next 11 months.

According to Director W. H. Semelius of the College, the Army contingents are entering the school in groups of 25. Those who take the eight weeks' intensive course will be able to fit crystals, replace hands, replace broken mainsprings, repair straps, and perform other less difficult repair work on 16 S watches. The 16

weeks' course will prepare men to do more difficult types of field repair, such as taking watches down, cleaning, reassembling and time-checking for accuracy. Many of the trainees who were selected for the course have had experience at the bench and are now taking the "refresher's course."

For some time past, the Army is reported to have felt the need of competent repairmen in the field. Returning watches to the factory for repairs means delay at best and is obviously impossible to many units on active duty. Officials of the Elgin National Watch Company conceived the idea of the new training courses as a further contribution to the war —Elgin is already heavily engaged in manufacturing war equipment—and negotations were recently completed with the Army.

Director Samelius and the College have worked out an intensive program for the Army's fledgling technicians. They will go to school eight hours a day, six days a week. Captain John M. Mullins, who, for the past two years, has been on duty at Fort Sheridan, is Commandant of the school.

The entire second floor of the collegs building has been remodeled in preparation for these special courses and will accommodate 75 students at a time. Instruction will be given by experienced watchmakers. The men will be quartered in the city of Elgin for the period of their courses.

Bench work is an integral part of the training being given to servicement—75 at a time—in the Elgin National Watch Company's Watchmakers College in Elgin, Ill., to equip them to make repairs in the field, thus saving valuable time which otherwise would be required to send watches back to the factory for adjustments.

At the same time, the third floor of the building has been remodeled to take care of the college's regular civilian students. Entirely separate and independent from the Army courses, the instruction in fine watch making regularly given by the college is being carried on under competent instructors. Civilian students may enter the college at any time to take the regular work in watchmaking, clockmaking, engraving and jewelry repair work, as in the past.

The new Elgin courses, believed to offer the only training of this character for Army personnel, are based on the experience and methods developed by the watchmakers college since its founding in 1920. Hundreds of students have been graduated from the school's regular courses, which are designed to help meet the demand for skilled craftsmen in the watch repair trade.

The college is operated under the personal supervision of Mr. Samelius, one of the country's foremost watchmakers, who not only gives lectures and teaches classes in theory and drafting, but also gives individual assistance in bench work. The condensed courses for Army personnel have been planned under his close direction.

The facilities of the watchmakers college include specially equipped classrooms with modern watchmaking equipment. The student also benefits from the three-quarter-century background of the Elgin National Watch Company and the new Elgin technical developments which have attracted the attention of the watchmaking world during the past ten years.

For training in the regulating of high-grade watches, for example, a ticker connected with the famous Elgin observatory gives correct time to the hundredth part of a second.

The special war training courses, designed specifically to meet a wartime need as quickly as possible, are thus based on the equipment, experience and methods used by the college for nearly a quarter-century. Already unique as the only watchmakers college maintained by a manufacturer, the Elgin institution expects to carry on its tradition of service by providing the Army with a group of men competent to make the necessary field repairs to Army watches—a function which derives its importance from the paramount significance of time in modern military operations.

Watchmakers In The War Effort

By HAROLD C. KELLY
Head Department of Horology
Southwestern Institute of Technology
Weatherford, Oklahoma

Mr. Chairman, members of Rotary and guests: I was asked to talk about watchmakers and their place in the war effort. First, however, I wish to tell you something about those of us who follow the watchmaking profession.

Because watchmakers look at the world thru an eye glass at close range, we are said to be short sighted. And because our vision is narrowed down to the confines of a watch, we are said to be very narrow in our view point on all matters. Yet in spite of these handicaps we watchmakers are not such a bad lot after you get to know us.

Even watchmakers have a sense of humor. I recall watching one of the horology instructors at the Bradley School of Horology paint the hands of a large tower clock. The huge minute hand caught the workman by the seat of the trousers and started carrying him up around the dial. He called back to me, "I'll be back in an hour".

Suppose that every clock, every watch, every scientific instrument that makes use of machines that record a division of time were to suddenly cease running. It would be impossible to conceive in this age of social, scientific and mechanized development, the confusion and disorganization that would follow. Even in peace time the disorganization would be inconceivable. How much more so would it be in war time.

Horology is a science that has a much larger field of usefulness that the servicing of clocks and watches. One of the earliest and greatest contributions to navigation was the invention and perfection of the chronometer. So important was the need of determining the location of ships at sea that the English government offered a prize of 20,000 pounds to anyone who could construct an instrument of such accuracy as to determine longitude within thirty miles. John Harrison, a Yorkshire carpenter, won the prize in 1760. His chronometer showed a variation of one minute and forty-nine seconds after a voyage of seven months.

Chronometers are needed today for the navy and it is the chief job of the

Hamilton Watch Company to attempt to supply this need. Heretofore the best chronometers were made in England and Switzerland and the foreign chronometer required that certain parts be made by hand. The American product is entirely machine made and is the first ever made by production methods.

And what are other watch factories doing? Bulova, formally a Swiss product, is now making watches in this country. Bulova is helping in the war effort by making jewels—sapphires—synthetically made. These are for precision instruments for aviation and navigation. Without them no bomber could fly, no battle ship could navigate—in fact the war could not be won.

The Gruen Watch Company is making precision instruments for the fire control room of battle ships. This is a statement taken from literature prepared by the Gruen Company. "Who fires the gun on a battle ship?" Maybe you thing the gun crews fire them. But the fact is they're fired by electricity from a switch board in the fire control room. One push of a button at the exact moment, the rolling, pitching ship is level and tons of deadly steel go screaming away at a twenty mile journey."

"It is vital that men in the control room know at all times the exact condition of the firing system. Electrical measuring instruments make this possible. Today Gruen are helping to provide precision instruments of this type for ships and planes."

The Elgin Watch Company is making carefully adjusted time fuses for anti-aircraft shells. To be effective an anti-aircraft shell must burst close to a plane. And with today's ships flying at such high speeds and high altitudes, this calls for the almost uncanny accuracy in precision timing down to the fraction of a second.

The Waltham Watch Company is making a number of products—stop watches, navy and aviation watches and clocks, compasses and jewel bearings.

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But where is the watch and clock companies getting the skilled artisans? These are coming from the jewelry stores and watch repair shops. Only last week I received a letter from a watchmaker friend of mine, now working in the Naval Observatory at Washington, D. C. repairing marine chronometers for the navy.

So great has been the withdrawal of watchmakers from the jewelry stores that the nation is faced with a serious shortage. The situation is so acute that the War Manpower Commission has ruled that watchmakers be deferred as essential workers. The fact remains that defense workers' watches and alarm clocks must be kept going as well as the watches of those engaged in trolley, bus and railway service, and civilian needs generally.

Our Navy Needs Your Chronometers

An appeal for chronometers for the duration made by the United States Navy in the March-April issue of this publication brought a number of responses and offers of fine instruments. However, it was obvious that many persons were under the impression that chronometer watches and mounted chronometer watches were needed as well. Unfortunately such is not the case, and offers of chronometer watches mounted and unmounted had to be declined.

Chronometer watches and mounted chronometer watches very frequently are confused with or mistaken for a Marine Chronometer, a much heavier and larger instrument. However, the difference between them are principally mechanical, the chronometer maintaining a steadier rate due to the use of the fusee and detent escapement which are not present in chronometer watches.

Naval vessels have an established allowance for horological instruments which includes standard chronometers, chronometer watches, and mounted chronometer watches. Present requirements for mounted and unmounted chronometer watches are being met by the Hamilton Watch Company. The present shortage is confined entirely to Marine chrono-

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It has detent escapement, fusee and chain.....

Diameter of Movement .....

Maximum running time per winding .....

Shipment at Govt. expense is desired .....

Remarks .....

.....

Please mail this form to U. S. Navy Department, Bureau of Ships, Attention: Code 875, Washington, D. C.

meters themselves.

Prior to the war, the United States was entirely dependent upon England and Switzerland for all chronometers. When this supply was cut off at the beginning of European hostilities American Manufacturers were persuaded to begin the manufacture of these precision instruments and for the first time they are being made in this country. However, due to the lack of facilities and skilled personnel necessary to turn them out in large numbers, it will be many months before adequate production can be keyed to the demands of rapidly expanding Naval forces.

The supply is still far below naval needs, despite the excellent response to the earlier appeal. Private owners of chronometers are the only sources upon which the Fleet can call at this time, and the need is urgent.

However, before sending in your instrument, it is desired that the accompanying statement be filled out and sent in so that the Naval Observatory can determine whether the instrument is of the type desired. It should be remembered, of course, that the Navy needs only the Marine chronometers with fusee, chain and detent escapement.

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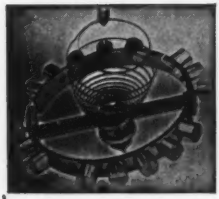

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Six Ways To Make Bookkeeping Easy

These six suggestions, based upon practical experience with the recording habits of watchmaker-jewelers for whom I do public accounting work will save a lot of time and grief in the recording of business transactions.

1.—Record all transactions daily. If recordings are permitted to pile up indefinitely and no entries made in the books, the system will bog down. Some watchmakers hold their invoices, petty cash outlays and other disbursements, purchases and cash receipts for days before entering them in the books. Enter every transaction with essential details the day it takes place. For the average watchmaker, such daily entries take less than half an hour, and often only 10 minutes. If transactions are allowed to pile up for days without handling, complications result and much more time must be spent on the work.

2.—Keep a close check on income. If possible, deposit each day's cash receipts in the bank TO THE PENNY, which will give a clean-cut picture of cash income on the bank statement. Reconcile the bank statement with the cash recorded on the books immediately upon receipt. Sometimes, during periods when business is brisk, these statements aren't checked for weeks, a lapse that may lead to trouble. Keep duplicate of deposit slips, listing each item separately. This will also aid when checking the accuracy of your cash book entries. If it isn't convenient to bank-deposit daily, it may be done semi-weekly, but deposit your receipts TO THE PENNY.

3.—Don't use your pant's pocket for a teller's cage. Some watchmaker-jewelers pocket some of their cash receipts, then pay bills out of pocket and fail to record all transactions, resulting in a mixup 'twixt income and outgo that is never straightened out, profit is inaccurately computed because all deductions are not taken,

income tax is paid on an excessive amount.

4.—Pay your bills by check so that you have a record of the transaction and an automatic receipt. Put the payee's name, amount paid, and the account on the check stub. We have audited the check-books of watchmaker-jewelers where the stubs were absolutely blank and checks sometimes, lost, strayed or badly jumbled, necessitating tedious and expensive analysis to prepare a financial statement. Keep accurate detail of income and outgo in your check-book.

5.—But what about expenses paid out in cash for postage, telephone calls and other small outlays not paid by check?" asked one watchmaker-jeweler when I advised him to pay all bills by check. The "Petty Cash Fund" is a standard accounting formula designed to pass cash pay-outs through your checking account. Follow this procedure: Draw a check for $5 or more, depending upon your total petty cash expenses per week. Cash the check and put the money in a petty cash box or drawer in the cash register, then draw upon this fund for petty cash expenses, leaving slips in the drawer for pay-outs. When the fund gets low, replenish it by drawing another check for $5 to "Petty Cash" and enter the expense slips in your books. Follow this procedure consistently so that petty cash expenses clear through the checking account. At all times, the slips in the petty cash depository, plus the petty cash on hand, should equal $5 or whatever sum the watchmaker sets as the fund's total.

6.—Fit the system to the business; never try to fit your business to a system. Frequently, we have inspected a watchmaker-jeweler's accounts to find that he was using a system, satisfactory for others or under other circumstances, but too elaborate or otherwise unadapted for his use, resulting in inaccurate recording after a time and a general breakdown of the system. A simple system that fits the business and keeps bookwork at minimum is the best. Buy a system specially designed for your requirements, if you can get it, rather than a general accounting system that you must adjust to suit your requirements.

Things You Should Know About Liabilities

It is unwise to fool yourself about what you owe. Be sure that all debts are entered on your books so that they appear on your balance sheet. What you own or what others owe you are your assets. What you owe others are your liabilities. Below we show a sample of the liabilities side of a balance sheet, a tabulaton covering the type accounts that may be carried as liabilities:

LIABILITIES

Current Liabilitics		
Accounts payable	$340	
Notes payable to the trade	100	
Notes payable to banks	500	
		$940
Fixed Liabilities		
Mortgages on real estate	$3,000	
Mortgages on building	5,000	
		$8,000
Contingent Liabilities		
Notes receivable discounted	$100	
Accomodation endorsements	50	
		$150
Accrued Liabilities		
Taxes, wages, Interest, rent, etc.	$125	$125
Reserves		
Reserve for depreciation on equipment	$ 800	
Reserve for depreciation on small tools	150	
Reserve for depreciation on building	3,600	
Reserve for depreciation on furniture and fixtures	540	
Reserve for bad accounts	250	
		$5.340
Net worth		13,520
Total liabilities and net worth		$28,075

Current liabilities are accounts due the trade, loans due banks and others. Fixed liabilites are debts that are longer term loans, such as mortgages, and, in the case of a corporation, outstanding bonds. Where a company has outstanding bonds, provisions should be made for a Sinking Fund to retire the bonds at maturity. The Sinking Fund appears on the asset side of a balance sheet and may be in cash or liquid investments. Contingent liabilities may not be actual debts but possibilties through endorsing the obligations of

others or damages that may be collected as the result of a law suit brought against a business. The watchmaker-jeweler should show contingent liabilities on the books when he discounts customers' notes at the bank because, if the customers default, the watchmaker-jeweler pays. Many do not show such contingent liabilities on their books, which gives an erroneous view of a financial condition. It is poor policy to jeopardize a business by endorsing paper for others. We know one watchmaker-jeweler who went broke making good on notes he endorsed for friends.

Reserves cover credits for depreciation on the various assets owned by the business. Sometimes reserves are shown on the asset side and deducted from their respective assets. This gives a quick picture of the condition of each asset or its value in relation to original cost. Reserves should be set up for bad debts as insurance against loss on accounts receivable.

The net worth is the difference between assets and liabilities if the business is operated by an individual or partnership. If a corporation, the net worth is the capital stock outstanding plus the surplus. The outstanding stock of a corporation has 3 values: par value, market value, and book value. The book value of a stock is determined by adding the totals of capital stock outstanding and surplus and dividing by the number of shares.

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Butchery and Botchery

By WILLIAM SIMON, JR.

I have read with great interest the articles on Butchery and Botchery. And each time I read such an article I find that the writer invariably suggests that the public should entrust their watch repairing only to reputable, experienced watchmakers; that they should avoid the "Dollar" shop, and other imposters.

In light of my own experience, which I judge is as meager as that of the average public, I had the following questions come to my mind after every article on Butchery and Botchery:

How is the average person to know whether or not the man who does his repairs is an experienced craftsman; who knows what he is doing and who takes pride in turning out quality repairs? How can he know, for instance, which shop is which when he is in a strange city and needs his timepiece adjusted or repaired? How can he know that the repairman, who charges five dollars for a job that the cut-rater charges one dollar for, is any better? How is a person, who never heard of horological associations, to know that "The Blank Watch Repairing Shop", which has a certificate showing that it is a member of such and such horological association, is the best place to take his fine watch?

I feel that the average Mr. Public would never take his timepiece to an unreliable repairman if he was able to recognize him as such. Has the watchmaking industdy done anything to inform the public of those shops it should avoid?

(It is hoped that the watchmaking industry, together with the jewelry industry and horological group, will extend greater effort towards publizing the information desired by the writer, and that in a course of time Mr. Simons' questions will be favorably answered by way of a greater understanding and result).

Boston Clock Dealer Has Vast and Unique Collection

By F. N. HOLLINGSWORTH

"The rustle of trees and forests are music to the outdoors man just as the ticks of clocks are to me," says Charles E. Mills of 445 Stuart Street, Boston, dealer in clocks of all kinds, particularly clocks with histories.

In his collection are clocks that play harmonious tunes, striking Westminster, Whittington or Guilford chiming phrases, Frieslan, Holland clocks dating to 1660 that are identified by their typical mermaid figures, English clocks even older than the Dutch timepieces and a clock picked up by a German sentry in Versailles during the signing of the peace treaty between France and Germany in 1871. This clock is believed to have been owned by Charles Louis Napoleon, the Pretender of France. Mr. Mills is doing a brisk business in the larger sizes of clocks, since the manufacturers are not making them.

He has secured the large clocks that once graced the walls of the old Adams House, Quincy House and Young's Hotel, in Boston, all three now torn down.

A developing sideline of Mr. Mills is the hobby of assembling grandfather clocks. He buys all sorts of parts for these old clocks, ranging from cases, works, weights and faces, and reassembles them himself. Exotic clock items include a Russian clock with Slavic script face, a Chinese clock finely made of brass, and very old cuckoo clocks from the Black Forest of Germany.

His store stock represents only about one-third of his collection. A basement storeroom and two other storerooms downtown are jammed full of rare old clocks. He has been collecting these clocks and rare types of watches for about eighteen years. All the clocks in his store are in first class working order, and going, but with varying times, according to their sizes and types of works.

Regulator Curb Blocks

By IMRO PETERMAN

Many of the cheaper grade Swiss watches have the regulator curb block without any means of opening as is usual in better grades, so, the watchmaker takes a chance and opens the curb with his tweezers. The tight curb resists and the tweezers slip, the hairspring is a hopeless tangle and this means a replacement at the employers expense.

If the curb block has a decided slope, square this off with a flat file and then file a slot at the base so that the screwdriver can be inserted and the curb opened in the usual manner.

Another good method is to file off a flat surface on the front of the curb and drill a very small hole in it. Then make a pin wrench to just fit this hole snugly, insert and turn in either direction and the curb will readily open.

The sketches illustrate both procedures.

The usual screwhead file is entirely too thick to cut the fine notch in the base of the curb shown in the second illustration, so the next best course is to take one of the single edged razor blades in common use, those with the reinforced back are best, and hold upright so that the cutting edge is on the face of a fine cut flat file. Give the back a light tap with the hammer, and you have a fairly serviceable file that will cut the notch in a number of curbs before the razor blade loses its cutting edge.

Fig. 1 shows the curbs as we ordinarily find them; Fig 2 shows the method of filing the backs and then the notch; Fig 3 shows the method of drilling the small hole so that the pin wrench will fit it.

Directed by
W. H. SAMELIUS, Chairman
Science of Horology and Technical Advisory Board

What is the percentage of wrist watches used as compared with pocket and other types?—Question by AI.

Answer by Fred M. Lund.—The percentage of wrist watches used today has grown from 20% in 1920 to over 90% today as compared with pocket and pendant watches.

But during that time, the movements of these watches have been gradually reduced in size until today the average mans wrist watch is the size of a quarter and the womans is considerably smaller than a dime.

AJ—To settle an argument, can you give any information as to how long the Keystone has been published?

Answer—The Keystone made its first appearance in August, 1883. It first appeared as a 4-page paper, then an 8, and finally a 16-page paper. It was published by the Keystone Watch Case Co., Philadelphia, at 25 cents per year. James Wilkins was the first editor, carrying on until he was succeeded by Robert W. Robins, January, 1887. From what I understand, the Keystone, as we have it today, is the outgrowth of the original Keystone, published by Keystone Watch Case Co.

CS——I am having trouble soldering dial feet fast to dials. It seems to take considerable heat and more often than not, the dial is burned or badly cracked. Can you recommend a method that will eliminate my troubles?

Answer—See that the surface of the dial is perfectly clean and the dial foot also clean. Use a mild soft soldering acid and a bismuth solder. This solder may be obtained from your material house, and is used for that purpose, as it melts at a very low degree of heat, and it lessens the risk of discoloring or cracking an enamel dial.

HWB——I have recently take a position and my employer wants me to make use of a lot of cracked and chipped enamel dials.

Answer—The best way to make use of cracked enamel dials is to crush them with a hammer. If, however, you are compelled to use the dials, the cracks may sometimes be partly hidden by applying a mixture of white rosin and white lead, mixed in equal amounts by heating. It will then act very much like sealing wax. To apply, heat the dial and also a knife blade, cut a piece of enamel of proper size, laying it on the dial when it may be spread, filling the cracks or holes. When cold, surplus enamel may be scraped off with a knife blade when the dial may be passed quickly over the alcohol lamp, long enough to gloss the enamel. Another formula is made up of white lead mixed with parafin wax and applied like cement. This can be polished by rubbing with tissue paper.

SAZ—While at a guild meeting, I heard two clockmakers talking about "tandem drive." Please explain what they meant.

Answer—A tandem drive clock is one where the same mainspring drives the time side as well as the strike side. In the early days, there were many were many clocks made this way. A single weight was sus-

pended on a continuous chain, this chain running over the drive wheel of the striking side, as well as over the drive wheel for the time side. The weight was suspended in the center, the time side main wheel supported the drum which was free fitting on the arbor, had ratchet teeth on it, and a click attached to the main wheel, the same as our main wheels and ratchets are made up today. When raising the weight, the chain rotated the loose drum and the click would engage the ratchet teeth in this drum, holding the weight in suspension.

CS—I have an old repeater watch that I have been unable to regulate the strike. It strikes all right up to about six, and then gathers speed so it is difficult to count.

Answer—In many of the early repeaters, the striking train ends with a pinon without any governor or balance wheel attached. The upper pivot in these early repeaters is carried in an adjustable bushing in order that the depth of the pinon into the wheel may be changed. Reducing the depth will increase the speed of the train and increasing the depth will cause friction enough to slow down the speed. The reason that the striking time in your watch is satisfactory up to six or seven, is that it takes that long a time for the train to get up headway, therefore, always adjust the pinion with the greater number of strokes, say 11 or 12. If the count is satisfactorily slow on the greater number of strokes, it will also be easily counted on a lesser number of strokes. The adjustable bushing that supports the upper pivot is eccentric, sometimes slotted so that a screw-driver may be used and sometimes the bushing has an extension so that a pair of flat pliers may be used when making the necessary adjustments.

One of the earliest ways of measuring TIME was by burning a candle or stick.

Trade Treaties Have Transferred Jobs of American Workers to Workers in Foreign Countries—Labor Officials Apprehensive That Modifications in Restrictive Immigration Laws Are Now Under Way

Walter W. Cenerazzo, (Waltham, Mass.) addressed the Ways and Means Committee, April 23rd, and, speaking for most of the 10,000 American workers, employed in the three remaining American Watch factories, protested the continuance of authorization to enter into Trade Treaties with foreign countries unless limitations were imposed preventing the entry of foreign made competitive articles at less than the costs of competitive American made goods.

Cenerazzo claimed that the protection intended for Americanworkers through the enactment of Restrictive Immigration laws was bi-passed by transferring the jobs of American workers to workers in foreign countries. He also stated that "labor officials are today apprehensive and fear that efforts are now under way to modify, if not eliminate, restrictions in our Immigration laws."

He said, "We see no advantage in barring the entry of the immigrant, and, at the same time permitting the competitive product of the immigrants at total landed costs which are less than American costs of production" of competitive articles of goods.

Cenerazzo stated that the imports of watches and watch movements during 1942 alone represented a loss of or a transfer of a full year's employment of 42,000 American workers to workers in Switzerland.

Conerazzo contended that Swiss watches and watch movements were shipped through Axis countries only through the consent of the Nazis and he stated, "the American consuming public (in purchasing products of Swiss workers) is thus helping to fi

(Continued on Page 36)

AERONAUTICAL INSTRUMENT SERVICE

Aircraft Instruments

EDITOR'S NOTE—Aeronautical Instrument Service is a subject untouched by publications in the Horological field, or in fact by any publication. In September, 1938, THE AMERICAN HOROLOGIST inaugurated such an educational service via prepared illustrated lectures to be used by U. H. A. A. organizations for the purpose of broadening our members' scope of knowledge in this field, which offered additional remuneration to those far-sighted enough to avail themselves of such knowledge.

"PiIot Static Tubes"

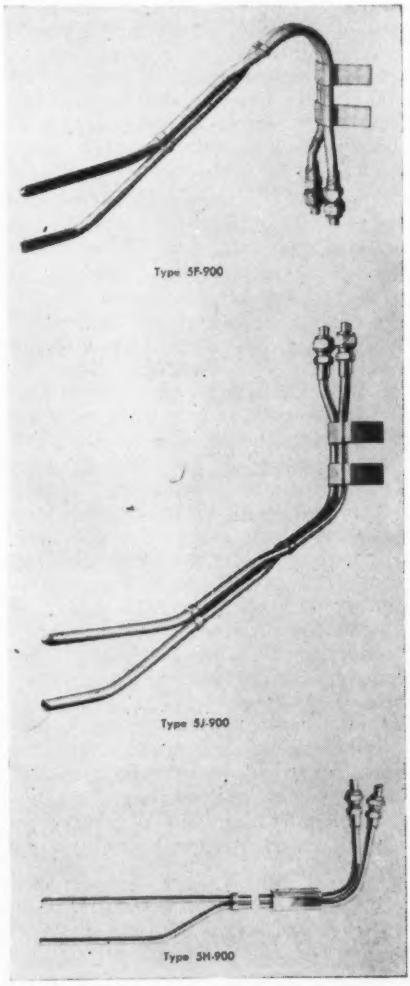
Article No. 43

The Pioneer Pitot Tube is used in connection with differential pressure type Airspeed Indicators. The unit consists of two tubes, one of which is open at the forward end to receive full impact pressure. The forward end of the other tube is closed and small holes or slots which admit static pressure are located some distance back from the leading end. The function of this device is to transmit to the indicator diaphragm impact and static pressures of the moving air. This result is converted into units of speed by the mechanism of the Airspeed Indicator.

While the Pioneer Electrically Heated Pitot Tube (shown on a separate circular) has been adopted as standard equipment on the majority of air transports and Army ships, the models here illustrated are universally popular. These three modes have identical performance characteristics, being different only in design to meet various mounting conditions. The conections between the Pitot Static Tube and the Airspeed indicator should be made with metal tubing. At the Lowest point in the line a drain tee (furnished with the Airspeed Indicator) should be installed to provide a means for draining any accumulated moisture.

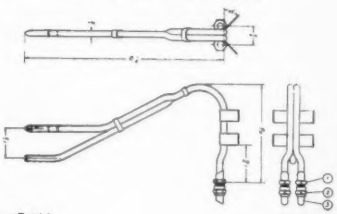
Location

It is absolutely essential that the Pitot Static Tube be mounted where it will receive an undisturbed flow of air Depending upon the construction of the airplane the Pitot Tube may be mounted either forward of the leading wing edge or twofifths of the way down from the top of the plane on a

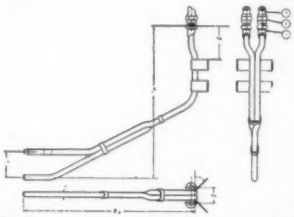


wing strut. In either case it should be located clear of the propeller slip stream. A Pitot Tube properly installed with metal tubes and soldered fittings requires no attention except periodic removal of the cap from each drain tee. Pitot Tube overall dimensions appear on the reverse side of this sheet.

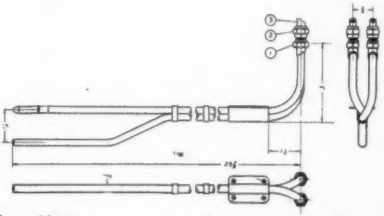
PITOT STATIC TUBE



Type 5F-900 Weight 5 oz.



Type 5J-900 Weight 5 oz.



Type 5H-900 Weight 8 oz.

Installation

Select a suitable location and secure the Pitot Tube in place, using linen tape which is then doped and varnished. Copper tubing 3/16 inches diameter is recommended for connecting Pitot Tube and Air Speed Indicator.

The Pitot Tube should be inspected periodically to insure static slotted openings and drain holes from being clogged with dirt or grit.

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nance Hitler's war against us.

Conerazzo called the Committee's attention to the fact that importers of watches were other than importers of liquors and possibly narcotics, the only ones forced to secure a license from the Treasury Department to import watches or watch movements. He also stated that the product of Swiss watch workers control from 50 percent to 80 percent of the American watch consuming market.

The full statement, presented by Conerazzo, is as follows:

The attitude I here express has the support of the workers in the Elgin and Hamilton companies.

Our organization unanimously voted to send me here to Washington to present the views of our organization concerning the extension of Reciprocal Trade Treaties. We are not against Reciprocal Trade Treaties. We are for them with the qualifications that those authorized to negotiate these trade treaties be limited to what they can negotiate insofar as allowing any competitive commodity, whether of farm or industry, to be imported into this country at not less than the cost for which it can be produced here.

Our industry is an old one. There are only three watch factories in the United States—the Elgin National Watch Co., of Elgin, Illinois, the Hamilton Watch Co., of Lancaster, Pa., and the Waltham Watch Co., of Waltham, Mass.

There were 60 American watch factories at one time. Twenty years ago there were seven; four of these, the Standard, Deuber-Hampden, Studebaker and Howard, have been forced out of business by foreign competition and their factories scrapped, in recent years.

In war times our industry thrives because Uncle Sam needs our products and demands unlimited production for the use of our armed forces. Our workers are continually working in excess of regular hours at the request of the Army and Navy. During these war times, World War I, and now World War II, the Swiss Government makes heavy inroads into the business of the American watch companies. The United States Government says to the American watch workers, "you cannot produce for civilian use as we need your output for American defense." We agree the United States Government is correct in so doing, but, on the other hand, the Swiss watch industry is given free reign to ship into the United States an unlimited amount of watches, at total landed costs which are less than our costs of production.

Since 1934, according to the Department of Commerce figures, there have been imported to the United States the following watches and watch movements, and as many as 42,000 Americans' jobs transferred to Switzerland in one year alone.

Year	Number of Watches and Watch Movements Imported	American Watch Workers man-hours Transferred to Workers in Foreign Countries Principally Switzerland	Number of Workers Years Employment Transferred to Workers in Foreign Countries	Foreign Declared Value of Watches Imported
1934	920,393	11,044,716	6,903	$2,834,092
1935	1,201,896	14,422,752	9,014	3,668,645
1936	2,228,606	26,743,272	16,715	5,877,676
1937	3,127,274	37,527,288	23,455	8,183,117
1938	2,386,226	28,634,712	17,760	6,562,370
1939	2,919,147	33,029,764	20,643	8,057,789
1940	3,536,982	42,443,784	26,526	10,220,772
1941	4,408,968	52,917,616	33,074	13,779,243
1942	5,691,804	67,301,648	42,064	20,775,443

The American watch worker produces one watch in approximately 12 hours. From the years 1938 to 1942, inclusive, the combined output of the three American watch factories was an average of 1,405,037 watches per year and they had an average of 6,800 employees per year. Personally, I do not know but I doubt if our total added exports, secured through our entry into the Trade Treaty with Switzerland, will equal this demonstrated loss of American man-hours of employment, in this one industry alone.

Just consider this outstanding fact: In 1942 there were imported into the United States, 5,691,804 watches and watch movements. If American labor had produced these watches there would have been 42,064 more persons employed for 1,600 hours per year and we would have had that many more available persons working on war materials for which the United Nations are sorely pressed.

Four times more watches were imported than were produced in the United States. The consumption or consumer demand for these watches is not that great. The answer is the Swiss watch importer, knowing that America's factories would be placed on war work, has built up a reserve stock here to sell to the American consumer during and after the present war.

The American jeweler who is trying to stay in business has to buy watches from whom he can, so he stocks up with foreign made merchandise which costs him just as much as a fine American made watch.

You can't blame him for trying to stay in business, but after the war we have the post-war problem of what to do with the increased personnel who have been trained for watch making during the war period. There will be no back-log of orders; the consumer demand will have been satisfied. During the war when people have an excess purchasing power they will buy the things they need. They can't buy automobiles; they can't buy many items, but they

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can buy Swiss watches. Those industries are protected for the post-war period, but how about the people that I represent? How about the people who work for the other watch companies? They have done their bit for their country. Waltham employees were one of the first to have attained 100 percent participation in the Payroll-Savings Plan for the purhase of War Bonds. 284 men out of less than 1,000 from the Waltham Watch Workers Union are in the armed forces. They are coming back, after having served their country to what? To a job, yes to a laid-off job.

In the meantime, Switzerland, surrounded by Axis, on the one side by Italy, on another side by Vichy-France, on the other side by Germany, is able to export into the United States, under a trade treaty with our enemy, watches and watch move ments. In exchange for these watches and watch movements, Switzerland is given millions of American dollars. Hitler receives his share of these dollars. The consuming American public is thus helping finance Hitler's war against us through the purchase of these 5,691,804 watches which were imported into the United States during 1942. Many of these watches are cased in the United States. They are sold under trade names, particularly nationally advertised names. Swiss watches being palmed off as American made.

These watches are assembled here of products of Swiss workers. Where does Switzerland get the raw materials for these watches during war time? How are they so safely escorted through Axis territory to reach America, we would like to know? This question of Swiss competition has been gone into very thoroughly in the past by far more able men than I, men who made a study of this because their financial interests were at stake.

This Committee recommended legislation to prevent the smuggling of watches and watch movements, mainly from Switzerland. The Congress enacted this legislation into law. This is known as the Walsh-McCormack Law.

This is the only instance we know of, other than that of liquor and possibly narcotics, where the Congress has required importers to possess a license from the Treasury Department. This law was especially aimed to stop the abuses which importers of Swiss watches had developed.

In 1934, at the hearings, briefs were filed, attorneys were hired to present to the Committee for Reciprocity Information facts which were vital to our industry. These facts were ignored and treaties negotiated and signed, notwithstanding the warning which was given at that time by Mr. T. Albert Potter, President of the Elgin National Watch Co. I quote Mr. Potter from testimony given by him on December 17, 1934:

"Remember, these fine craftsmen in Europe are not only makers of watches but many of them, even today, as adjuncts to watch factories, are actively engaged in the making of parts for foreign munitions factories."

A man in Maryville, North Dakota with the use of an old clock has hitched up an alarm that goes off when his tires get underinflated.

"They're The Only New Timepieces I've Got in The Store."

TIME for War

In Seattle, the Board of Education asked for a return to standard time during the winter months. The Board contends that the warTIME schedule increases, rather than diminishes the consumption of electric power, and that the safety of school children is jeopardized when they are required to go to school in the dark.

CLOCKS in Vatican City also were advanced one hour. Down under, in Australia, CLOCKS were set back to normal time, 12 to 14 hours ahead of Eastern War TIME.

In Germany and territory she dominates, summer TIME has been inaugurated, advancing clocks an hour to make tthe TIME difference six hours ahead of Eastern War TIME.

When the ill-fated submarine Squalus was raised off Portsmouth, N. H., after resting on the bottom of the Atlantic Ocean for 112 days, the only mechanical device still in running order was a Navy CLOCK. A lens of methyl methacrylate plastic kept the CLOCK air and water tight during submersion.

Never late to punch the TIME clock is Britain's conscientious King, George VI. When he is rehearsing a radio speech, no secretary, but Queen Elizabeth herself, stands by with a STOPWATCH to check his TIMING.

Thousands of Indians in Guatemala figure TIME by the ancient Mayan calendar of 18 months of 20 days each, with five days added to make 365.

What Time?

Are you an offender? A customer writes from Florida: "Those merchants, repairmen, and others who leave their shops, sticking a sign in the window, 'will be back in 15 minutes,' ought to indicate in some way the time when they left the shop. It's always from 10 to 20 or 25 minutes. A person might wait if he knew what time the party he waited for would be back, whether he had to wait 25, 20, 10 or 5 minutes."

Horological Association of Pennsylvania

The Horological Association of Pennsylvania in January, 1943, had every hope of introducing a state Licensing Bill in behalf of the watchmakers. Several obstacles stood in the way of presentation.

The first misfortune was that of the critical illness of their legal advisor, Mr. I. E. Binstock. Then opposition appeared in various sections of the state among the Jewelers who were not fully informed in regard to the benefits to the Jeweler, the public, and the watchmaker. It appears that these Jewelers in opposition do not as yet appreciate the value of the protection of the watchmaking industry and profession, in their own behalf and better interests.

Pennsylvania feels confident that when these Retail Jewelers appreciate the fact that the very founda-

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tion of their business is in good service to the public, they will place their business as well as the watchmakers in the confidence of the public they serve.

This temporary set-back is noted to the Pennsylvania watchmaker, that he has much to overcome and a great deal of missionary work to do before the bill can again be presented. If a Legislative act is not presented and passed before close of this war, or shortly thereafter, the Watchmaker and Jeweler is apt to find a new low in wages and service rendered. It is felt by those in Pennsylvania, that the wage scale will drop as low as fifteen to twenty dollars per week for watchmakers and with that the continued use of repair cut-prices, undoubtedly on a larger scale than ever before, and the use of a repair department as a bait to try to get new customers for that type of an establishment which seems to demand some special advantage over the true and honorable type of time-tested methods of legitimate business.

Minnesota Master Watchmakers' Association

The Annual Meeting was held at the Nicolet Hotel, Minneapolis, on May 2nd.

A large and enthusiastic group was present to celebrate the passing of the Watchmakers Licensing Law.

President W. C. Westphal remarked that this was the result of six years' effort and was just the beginning of a new deal for the watchmakers of Minnesota.

The co-chairman of the Legislative Committee, Fred Ohlsen, of Marshall, representing the Minnesota Master Watchmakers Ass'n., and Earle Barker, of Bemidji, representing the Minnesota Retail Jewelers Association, spoke briefly on the work and expense of passing the law.

Officers elected for the ensuing years are:

President—W. C. Westphal, Minneapolis.

Vice-President——H. W. Schmidt, Duluth.

Treasurer—Carl Berger, Tracy.

Secretary—C. W. Gaskell, St. Paul.

National Trustee—R. C. Schenk, St. Paul.

Board of Directors was elected as follows:

L. E. Dewey, Minneapolis; A. B. Peterson, Windorn; A. W. Skogg, Duluth; Herbert Witte, St. Paul.

The Governor requested the Association elect eleven names for his information, out of which he would select the necessary number to comprise the new Board of Examiners.

During the banquet, Senator Harry Bridgman, and Representative Leonard Dickerson, were presented with Hamilton wrist watches, in appreciation of their services in supporting the law, and guiding it through the Legislature. The watches were a joint gift of the Minnesota Retail Jewelers Association and Minnesota Master Watchmakers Association.

Horological Association of Massachusetts

The State Association of Massachusetts held it Annual Convention, April 14, 1943, in Worcester, Massachusetts.

The meeting was presided over by President W. D. Hebert. Mr. Hebert gave a very complete report on the activities and progress of the state association during the past six months.

Vice-President A. J. Frappier, reported on the opening of a Club Room in Springfield and spoke very enthusiastically on the increase in membership.

Secretary Wm. H. Bright reported considerable work done on the apprenticeship program as well as Legislation. He stated that all Guilds are doing a better job in many ways than had been done in the past, especially Hampden County Horo. Guild.

Mr. Blaine Libby, Chairman of the Legislative Committee, reported that

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the state bill had been deferred in committee with the recommendation, "Leave to Withdraw." Mr. Libby was reappointed chairman of the committee to carry out the work of revising the state bill so as to comply with the request of the lawmakers of Massachusetts.

The state has mapped out a campaign for Membership Drive they are sure will double the strength of the state as it now stands.

Wisconsin Watchmakers Association

The Wisconsin Watchmaker Association held its annual meeting of members on May 2nd, at Hotel Wisconsin, Milwaukee. This was in lieu of our annual convention, which was abandoned in accordance with the request of the federal government for curtailment of unnecessary travel.

PRESIDENT
C. B.
LANGENDORF

C. B. Langendorf, Milwaukee, President; Wilbur Guell, Fon du Lac, Vice-President; B. W. Heald, Milwaukee, Secretary; Al. Loose, Milwaukee, Treasurer; E. C. Schattschneider, West Allis, Technical Director; Warren Te Ronde, Milwaukee, Ass't. Technical Director; C. G. Anderson, Milwaukee, National Trustee.

Following the business meeting, a buffet luncheon was served to the members and their ladies through the courtesy of the Milwaukee Wholesale Jewelers Association.

New York State Watchmakers Association

In keeping with the rushed condition of all watchmakers also travel and war conditions, a one day "Streamlined Convention," was held Sunday, May 16, at the Onondaga Hotel, Syracuse, N. Y. Among the Guilds represented, were delegates from Albany, Binghamton, Elmira, Rochester, Syracuse, Utica, and scattered Delegates-at-large, Pennsylvania was also represented. The order of business moved right along and many issues were taken care of, including Licensed Legislation for Watchmakers, which was discussed with much enthusiasm. The session closed with the election of officers for 1943-44. John DeVogel, of Albany succeeded himself as President; Charles K. Ottarson, of Rochester,

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also succeeded himself as Vice-President; E. A. Patterson, of Endicott, replaced Fred C. Nhare, of Syracuse as Exec. Secretary; Herbert W. Steer of Syracuse, replaced Benson S. Murray of Morrisville, as Treasurer; Robert G. Taylor, of Utica, replaced Clarence M. Engelbert of Rome, as National Trustee.

Kansas State Horological Association

The Kansas State Horological Association and the Kansas Retail Jewelers Association, held their annual joint convention on Sunday, May 16, at the Lassen Hotel, in Wichita, Kansas. Following the registration, there was business sessions for the watchmakers at 10 A. M., with President P. E. Loomis, of Newton, presiding. An election of officers was held, with the following results:

President—P. E. Loomis, Newton, re-elected.

First Vice-President—V. A. Webster, Hays.

Secretary—Norman L. Osborne, Wichita, re-elected.

Treasurer—Jewel Bonat, Wichita.

National Trustee—W. B. Brasfield, Wichita, re-elected.

Regional Vice-Presidents—Harry L. Shafer, Emporia; Harold Walker, Kingman; William Hoffman, Dodge City; Doyle Gamber, Abilene; State

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GUSTAVE VAN ERP, *Director*
111 E. 31th St. Kansas City, Mo.

Instrument Repairing

Technical Advisor, W. H. Widiger, McPherson, re-elected.

The following was passed to be included in our proposed bill for State Registration of Watchmakers in Kansas: Resolved that—

Should Kansas pass a State Registration law, any watchmaker that enters the armed services or a defense plant be given one year from the duration in which to register as a watchmaker in Kansas.

Jewel Bonat, President Wichita Horological Guild, suggested that each watchmaker in the state collect all of his old watch and clock cases, and other metal scrap and turn it in to the Local Salvage Committee, to help out in the war effort. Everyone present agreed on the idea.

After the noon luncheon, there was a round table discussion of current problems on the jewelry industry. Mr. B. A. Strickler, Salina, President K. R. J. A., presided. Mr. Rudy Huegsen, Bauman-Massa Co., St. Louis, Mo., spoke on "Diamonds." Mr. Frank Anger, Maschmeyer-Richards Silver Co., St. Louis, Mo., talked on "Silverware." Mr. Leon Meyer, Meyer Jewelry Co., Kansas City, Mo., told about the "Gold" situation. Mr. Had Whitney, Edwards-Ludwig-Fuller Co., Kansas City, Mo., gave some interesting information on "Watches." Mr. Syd Prague, C. & E. Marshall Co., Chicago, Ill., talked about the "Watch Material" situation today. Much valuable knowledge was passed on to fellow jewelers as a result of these discussions.

We wish to give special credit to Miss Lucille Barenberg, who for the past three years has contributed much towards the success of the Kansas Retail Jewelers Convention. Her untiring efforts and time to take care of all details and financial set-ups has aided the State Secretary greatly.

There was a large attendance in spite of the transportation difficulties in gas rationing. Several wholesalers and salesmen displayed their lines, enabling many of the jewelers to see and buy latest in jewelry creations.

Cincinnati Guild

The Cincinnati Guild is exceedingly active, and although they have lost their licensing bill this year, they are still striving to put it through at the next session. Our meetings have been well attended. We had the pleasure of having our old secretary, Joe Besse, with us, who gave us quite a talk about our navy, of which he is now a member. Recently this magazine listed Louis Boesing, as being in the navy, instead of Joe Besse. Our guild is now planning for a great outdoor picnic to be held at Frank Foegler's summer home. The committee is planning to see that everyone has a grand time.

Herbert F. Hueil,
Corresponding Sec'y.

Central Missouri Horological Guild Bulletin Extracts

Let's make our orders to the material houses plain enough so it does not take a mind-reader to fill the order. Remember they have a hard time getting experienced help, so let's take an extra minute and give them the correct numbers and as much information as possible with the old piece as a sample.

* * *

First girl: My watchmaker is very religious.

Second girl: What makes you think so?

First girl: Because every time I go in, he is down on his knees.

* * *

No situation becomes so bad but what you can lose your temper and make it worse.

* * *

Our secretary, Clint Holt, left for Fort Leavenworth on Friday, April 23rd to be one of the boys with Uncle Sam. Best of luck from all of us.

* * *

As Lum and Abner would say: I have told you a thousand or a hundred times to keep your screw drivers and gravers sharp.

Watchmakers Association of New Jersey

The Association held a State-get-together meeting May 13th.

There was a small but interested gathering.

The Counties of Bergen, Essex, Hudson, Morris, and Union were represented at this meeting.

President Harry Van Laar greeted the members and after the business meeting an interesting talk on organization and the purpose of the Licensing Legislation which they intend to pursue.

Each member present was designated as a committee of one to contact former members and urge them to come to the meetings. It was decided to hold regular monthly meetings on the second Thursday of every month and the regular meeting place to be the large meeting room of the Swiss Yodel Tavern, Clinton Avenue, Irvington.

The next meeting to be held Thursday, June 10 and a social get-together meeting will be held June 13th.

Charles G. Soemer, Secy.

Minnesota State Board of Examiners

The first Board of Examiners in Watchmaking, consisting of W. C. Westphal of Minneapolis, Paul Teske of Hibbing, J. C. Crooker of Fairmont, H. A. Johnson of Spring Valley, and C. W. Gaskell of St. Paul, will hold its first meeting soon to organize and elect a President and Secretary.

Change of Business Hours

Mr. R. T. "Dick" Gallien of 220 West 5th Street, Los Angeles, California, establishes new office hours. 8:30 A.M. to 12:00 noon. Government priorities ordered only.

12:30 P.M. to 5:00 P.M. watchmakers and jewelers supplies. Closed Saturday.

Annual Conference Illinois Watchmakers Association

Annual Conference of Illinois Watchmakers Association was held Sunday, May 23rd, 1943 at the Hamilton Hotel.

Those on the speakers roster, who gave very interesting and valuable addresses were: Wm. Samelius, Dean Elgin Watchmakers College; Ed. Falkenhayn, President, Chicago Horological Guild; J. F. Macke, National Trustee, "The Answer Man."

The meeting was followed by a Buffet Supper at 6:00 P. M.

S. E. Arscott, Sr.

S. E. Arscott, Sr., 86, Watchmaker and Jewelry Store Operator Dies

Mr. S. E. Arscott, Sr., passed away May 15th of a heart attack.

A native of London, England, Mr. Arscott came to Denver in 1888.

He was in business with his son, and active at the watch bench up to the day before his death.

The Old Timer Retires

The entire stock of Clark Tool and Material Company was purchased by Jules Borel & Company of Kansas City.

Borel and Company will take over the business of Mr. Clark on June 1.

For thirty-one years Art Clark served the Trade faithfully and his many friends regret seeing him enter into retirement at this time.

File Production Doubled

The Grobet File Company of America, importers of genuine Grobet precision Swiss files and manufacturers of Rotary Files, announce that they have more than doubled the factory area of their New York plant at 421 Canal Street.

This added floor space will streamline the production of Rotary Files and Ground Cutters and facilitate greater output.

Jesse I. Hansen

After forty-two (42) years in the retail business in Denver has sold his retail interest to Walt Hansen his former partner. Mr. Hansen has not retired from active business. He is now engaged in special work on watch, clocks, and tools. Those in the trade, who are well acquainted with Mr. Hansen, will be pleased to know that he is still serving, not the public, but those of his class and profession.

Five Day Week Adopted

C. P. Markham of El Paso, Texas, has found that his repair work is so heavy that he is unable to accomodate customers six days a week. For this reason, he has adopted the five day week, closing his store on Thursday to the public, giving him an opportunity to catch up and give better service to the public.

The Jewelers Association of El Paso have attempted to adopt this form for all stores, but the movement was blocked by jewelers, who would not co-operate. Mr. Markham still maintains his five day week to the public.

Forty Years of Service

Harman Watch Company, Inc., this month celebrates its 40th year of continuous and successful operation. Founded 1903 by Harry Friedman, who is still active as President of the Company, the Harman organization has pioneered in the manufacture and merchandising of Men's and Ladies' watches. Its progress and growth have, from the very beginning, been steadily sustained. To handle recent substantial increases in its business, the company has enlarged its quarters now occupying the entire 14th floor of 22 West 48th St., New York City. As part of its aggressive and extensive 1943 advertising and merchandising campaign, undertaken in the interests of its dealers, the Harman Watch Company is now broadcasting daily over 25 radio stations, stretching from coast to coast.

Polishing Pivots

From Gribi—Page 162

There are workmen who have formed the habit of polishing balance pivots every time they clean a watch, or at least whenever they show the least wear. "THIS IS BAD PRACTICE". The watch will not go any better for that reason; on the contrary, it may go much worse, for every time the pivots are repolished they are not only diminished in size, which of itself is detrimental, but the shape of them is altered. When pivots are cut badly enough to interfere with the time keeping of the watch, the proper remedy is a new balance arbor.

U. S. Coast Guard To Elgin

To the Men And Women of Elgin Watch Co.:

You will be interested to know that a stop-watch of your manufacture played an important part in the sinking of a German submarine, and the capture of 33 members of its crew, by the Coast Guard Cutter "Icarus." A recent combat report from Lt. Commander M. D. Jester, Captain of the "Icarus" in the action, stated: "I used an Elgin stop watch to time my depth charge attacks. I figured our distance from the sub as recorded by the sound gear, the speed of our ship going toward the sub and the time it takes for the charges to sink to the proper depth. I did not have to guess, because the split-second accuracy of the stop watch enabled me to drop my charges right on him every time. The fourth pattern blew him to the surface, and in four minutes, our guns blasted him to the bottom." The Coast Guard congratulates you on the fine precision timekeeping equipment you are making for the Navy. Let us have more.

R. R. Waesche,
Vice Admiral USCG, Commandant U. S. Coast Guard.

Despite the war, Switzerland is increasing it production of WATCHES.

SPECIAL NOTICES

Rates under all headings except "Situations Wanted," $1.50 for first 25 words, five cents for each additional word. "Situations Wanted," 75c for first 25 words, five cents

WATCHMAKERS WANTED

WANTED

A-1 watchmaker, draft exempt, permanent position in air-conditioned store, town of 5,000. Salary $50.00. Pratte's Jewelry and Optical Company, Festus, Missouri.

FOR SALE

Five Swiss wrist-watches in white cases, 6½, 6¾, 10½L and baguettes, requiring some repairing, $15.00. Genuine Zircons, blue or white, diamond cut, $1.00 per carat. B. Lowe, Box 311, St. Louis, Mo.

FOR SALE

One Pound Broken Movements and material—$3.50. One hundred Assorted used watch stems—$2.00. Two gross assorted new watch crystals—$2.75. One dozen clean used dials—$2.00. Write for prices of used watch movements. B. Lowe, Box 311, St. Louis, Mo.

Lathe Repairing, Wheel Cutting, Special Watch and clock parts to order. Estimates on all work. (No general Watch Repairing) Jes I. Hansen, 1007 Marion St., Denver, Colorado.

WANTED

Late Model Watchmaster or Paulson Timing Machine at once. Will Pay Cash. Box 535, The American Horologist.

WANTED

Watch cleaning machine, Marshall machine preferred. Send information on condition and price in first letter. John J. Segner, 242 West Main Street Fredericksburg, Texas.

Watch and Clock Repairer wants position. Bowman Technical Graduate. Fifteen years experience, also repair Aviation instruments, $75.00 per week. Chas. R. Freed, Mt. Pleasant, Pennsylvania.

WANTED TOOLS AND BOOKS

Lathe Attachment, Wheel Cutter, Pivot Polisher, "Derbyshire," Technical books such as Britten "Watch and Clockmakers' Hand books", Etchells "Repairing Repeating" Watches", Finn, Reifler" Compensating Pendulums. Gould "The Marine Chronometer. The American Horologist, Box 534.

Cash for Derbyshire Combination Tail Stock (rack lever type) in good condition. Needed for high priority work. Paul C. Kauffman, 63 Madison, Seattle 4, Washington.

TOOLS FOR SALE

New and Used Wheel-Cutters; Slide-Rests; Lathes and Attachments. Cash paid for Used Watchmakers' Lathes and Attachments. R. P. "Dick" Gallien, 220 W. 5th St., Los Angeles, Calif.

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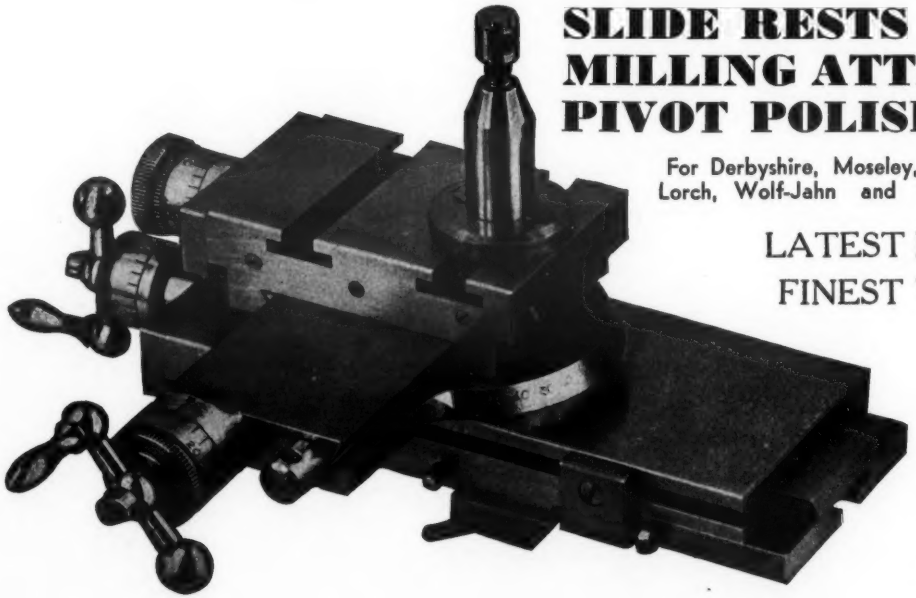

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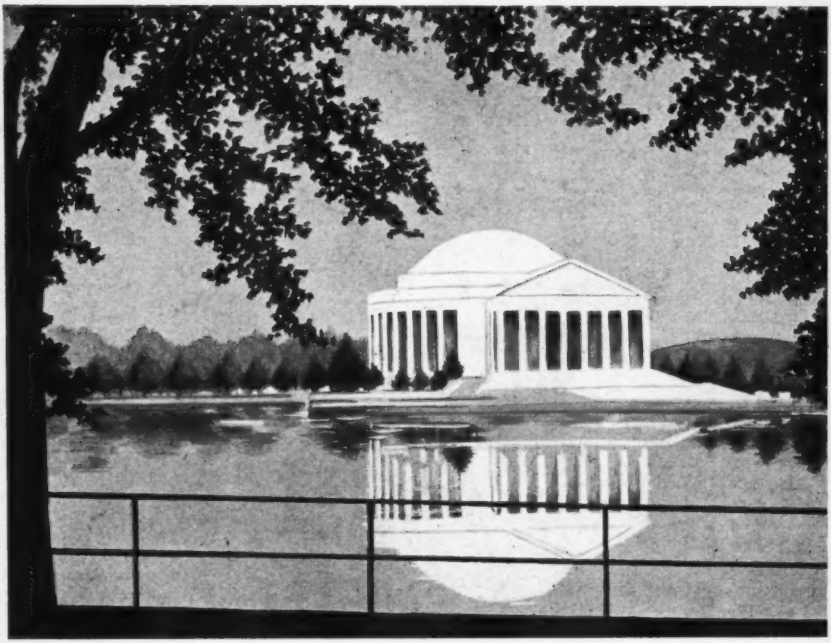

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